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L8: Entry 7 of 14 File: DWPI Nov 18, 2002

*** TESTING *** DB=OPTX, PIECE=33 (D194)

DERWENT-ACC-NO: 1994-268672
DERWENT-WEEK: 200279

TITLE: Prepn. of alcoholic beverage - by using gel-coated immobilised yeast to control di:acetyl prodn.

PATENT-ASSIGNEE:

ASSIGNEE	CODE
SAPPORO BREWERIES	SAPB

Same asn
Ianata

PRIORITY-DATA: 1992JP-0358798 (December 28, 1992)

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PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
JP 3346811 B2	November 18, 2002		003	C12C011/02
JP 06197749 A	July 19, 1994		004	C12C011/02

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
JP 3346811B2	December 28, 1992	1992JP-0358798	
JP 3346811B2		JP 6197749	Previous Publ.
JP 06197749A	December 28, 1992	1992JP-0358798	

INT-CL (IPC): C12C 11/02; C12G 3/02; C12N 11/04

ABSTRACTED-PUB-NO: JP 06197749A
BASIC-ABSTRACT:

The prepn. of alcoholic beverage uses gel-coated immobilised yeast.

The double-immobilised yeast is pref. prepd. by dropping a mixed suspension comprising yeast and an aq. soln. of a gelling material from the inner tube of a double-tube nozzle and an aq. soln. of a gelling material from the outer tube of the nozzle, to a gelling agent, to gel in order to form another gel layer on the yeast-immobilising gel. The gelling materials include sodium alginate, pectin, chitosan, carrageenan, agar and gelatin. The gelling agents are calcium-, strontium-, barium-, aluminium-, and iron ((II) or (III)) chloride, for sodium alginate, and pectin, sodium (hexa)meta- or poly-phosphate and tricalcium phosphate for chitosan, potassium chloride, calcium chloride and ammonium chloride for

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* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] By using in more detail what covered the front face with gel as fixed yeast about the manufacturing method of an alcoholic beverage, this invention suppresses generation of diacetyls and relates to the approach of manufacturing the alcoholic beverage by which the flavor was stabilized for a short period of time. In addition, as an alcoholic beverage made into the object of this invention, although there are Biel, sake, wine, etc., especially Biel is suitable.
[0002]
[Description of the Prior Art] Generally manufacture of an alcoholic beverage adds yeast to brewing raw material liquid, and when yeast metabolizes a substrate and generates ethyl alcohol, it is performed. In this case, diacetyls carry out a byproduction unescapable. Here, diacetyls name generically the aceto hydroxy acids which are these precursors, such as acetolactic acid and aceto hydroxybutyric acid, in vicinal diketone lists, such as diacetyl and a 2,4-pentanedione.
[0003] It generates in the first half of the fermentation in manufacture of an alcoholic beverage, and most is the precursor of vicinal diketone, and it comes to be decomposed [if it remains as it is, it is not decomposed depending on a use microorganism, i.e. yeast, but] only after the diacetyls which exist in fermented mash serve as a vicinal diketone body. However, since it is a pure abiosis study chemical reaction and a fermentation anaphase is comparatively performed at low temperature, the rate of this chemical reaction is slow, it becomes rate-limiting and the reaction from which a vicinal diketone precursor is changed into a vicinal diketone body needs it for manufacture of an alcoholic beverage with low diacetyl concentration in long duration.
[0004] [J. as which various approaches are proposed from before about the continuation manufacturing method of an alcoholic beverage, for example, the continuation distilling method of wort using the fixed yeast which the technique which is made to include yeast in water gel and fixes it progressed, carried out in this way, and was obtained is proposed They are Inst.Brew., 84,228 (1978) and EBC Congress, Proc., and 505(1981)]. . Since yeast can be used for these approaches by high concentration, they can aim at compaction of a brewing period. However, since it is required to be unable to escape the problem of a proper, i.e., the problem that the diacetyl concentration of the fermented mash to generate is high, to the brewing by high yeast concentration, therefore to ripen fermented mash over a long period of time, utilization is obstructed.
[0005] On the other hand, controlling generation of diacetyls is proposed by adopting fermentation conditions (for example, anaerobic fermentation, low-temperature fermentation, etc.) without growth of yeast substantially in the high yeast concentration distilling method by fixed yeast etc. [EBC Congress, Proc., 331 (1985)]. However, by these approaches, the process for making wort into an anaerobic condition is needed.
[0006]
[Problem(s) to be Solved by the Invention] The purpose of this invention is offering the approach of manufacturing the alcoholic beverage by which suppressed generation of diacetyls as much as possible,

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and the flavor's was stabilized for a short period of time.
[0007]
[Means for Solving the Problem] That is, this invention relates to the manufacturing method of the alcoholic beverage characterized by using what covered the front face with gel as this fixed yeast in the manufacturing method of the alcoholic beverage which uses fixed yeast.
[0008] The yeast used for this invention can specifically mention Saccharomyces cerevisiae, Saccharomyces UBARUMU, etc. that what is necessary is just what metabolizes brewing raw material liquid and produces ethyl alcohol, a carbon dioxide, etc.
[0009] Although yeast is fixed with a conventional method, in this invention, it is required to cover the front face with gel further so that this fixed yeast may serve as aversion-conditions. By specifically covering the support by which yeast was fixed in the layer of gel, internal yeast can be aversion-and generation of diacetyls can be suppressed.
[0010] About creation of such duplex fixed yeast, it is already indicated by JP,64-67189,A. Although there is a method of the gel which fixed yeast being immersed in the water solution of the matter which has gelation ability in detail, supplying this in a gelling agent, and making the layer of gel form etc., it is good to use the duplex fixed yeast by the following approach preferably. That is, the water solution of the matter which has gelation ability for yeast and the mixed suspension of the water solution of the matter which has gelation ability from an outer tube is dropped and gelled from the inner tube of a double pipe nozzle in a gelling agent to coincidence, and it is obtained by forming the layer of another gel in sheathing of the gel which fixed yeast.
[0011] As matter which has the gelation ability used for creation of the above-mentioned duplex fixed yeast, a known thing can be used for arbitration, for example, sodium alginate, pectin, chitosan, a carrageenan, an agar, gelatin, etc. can be mentioned. Moreover, that what is necessary is just to use the well-known matter, a gelling agent also has the matter which generates fusibility multivalent cations, such as a calcium chloride, a strontium chloride, barium chloride, an aluminum chloride, and ferric chloride (divalent, trivalent), when the matter which has gelation ability is sodium alginate. In the case of pectin, water solutions, such as a calcium chloride, a strontium chloride, barium chloride, an aluminum chloride, ferric chloride (divalent, trivalent), and a magnesium chloride, are used, and when it is chitosan, water solutions, such as trivalent phosphate, such as polymerization phosphoric acids, such as sodium metaphosphate, hexametaphosphoric acid sodium, and sodium polyphosphate, and tribasic potassium phosphate, are used. Moreover, in the case of a carrageenan, water solutions, such as potassium chloride, a calcium chloride, and an ammonium chloride, are used, and, in the case of an agar or gelatin, cooling water, an oil coolant, etc. are used.
[0012] Next, it is the solution or dispersion liquid which usually contains a saccharide including the substrate of yeast as brewing raw material liquid used in order to add and cultivate the duplex fixed yeast obtained as mentioned above. the saccharification which used the wort, fruit juice, well-known honeydew, and cereals as the raw material at the example of such brewing raw material liquid -- there is liquid etc.
[0013] The fermentation by this invention puts the sterilized brewing raw material liquid into the fermenter containing duplex fixed yeast, and is performed under an anaerobic condition at 10-15 degrees C.
[0014]
[Example] Below, an example explains this invention in detail.
The suspension added and mixed was put in so that it might become 100ml of 2% sodium alginate water solutions from the outer tube of the creation double pipe of example duplex of manufacture fixed yeast from an inner tube in 100ml of alginic-acid water solutions 2% and might become 106cells(es) / 1ml of sodium alginate water solutions about beer yeast (Saccharomyces cerevisiae), and these were continuously dropped at coincidence into the 0.1M calcium chloride water solution, and were left for 1 hour. This obtained fibrous duplex fixed yeast with a diameter of 2mm.
[0015] Standing fermentation was performed [be / it / under / wort / which adjusted the duplex fixed yeast obtained in the example of example manufacture to the sugar content P of 11 degrees (plateau) /

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adding] at 13 degrees C for 48 hours. The generated total diacetyl (precursor is included) concentration was measured after fermentation termination. A result is shown in drawing 1 . Also in fermentation, generation of diacetyl was very low, was after fermentation termination, and was 0.16 mg/l so that clearly from drawing. Moreover, the ethanol concentration at this time is 3.6% (w/w), and the leakage of yeast was not accepted at all, either.

[0016] On the other hand, fibrous fixed yeast with a same diameter [the / as usual] of 2mm was prepared using only an inner tube as contrast, and the total diacetyl concentration fermented and generated on the same conditions as the above using this was measured. A result is shown in drawing 2 . A lot of diacetyls generated during fermentation, and the concentration after fermentation termination was 0.7 mg/l so that clearly from drawing. Moreover, the ethanol concentration at this time is 3.6% (w/w), and yeast is 1.0x106. It ml[an individual/]-leaked and had come out.

[0017]

[Effect of the Invention] According to this invention, in manufacturing alcoholic beverages, such as Biel, continuously using fixed yeast, generation of diacetyls can be suppressed and the alcoholic beverage by which the flavor was stabilized can be manufactured efficiently for a short period of time.

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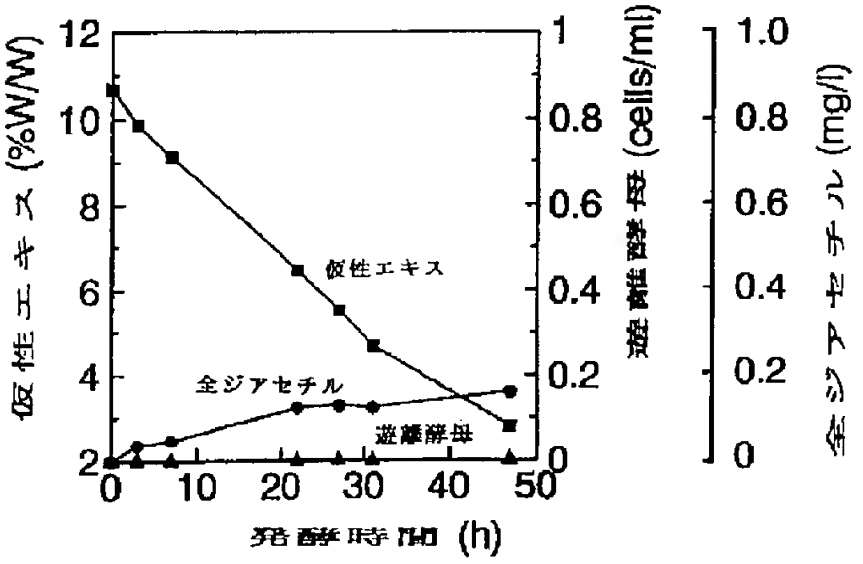
Drawing selection drawing 1



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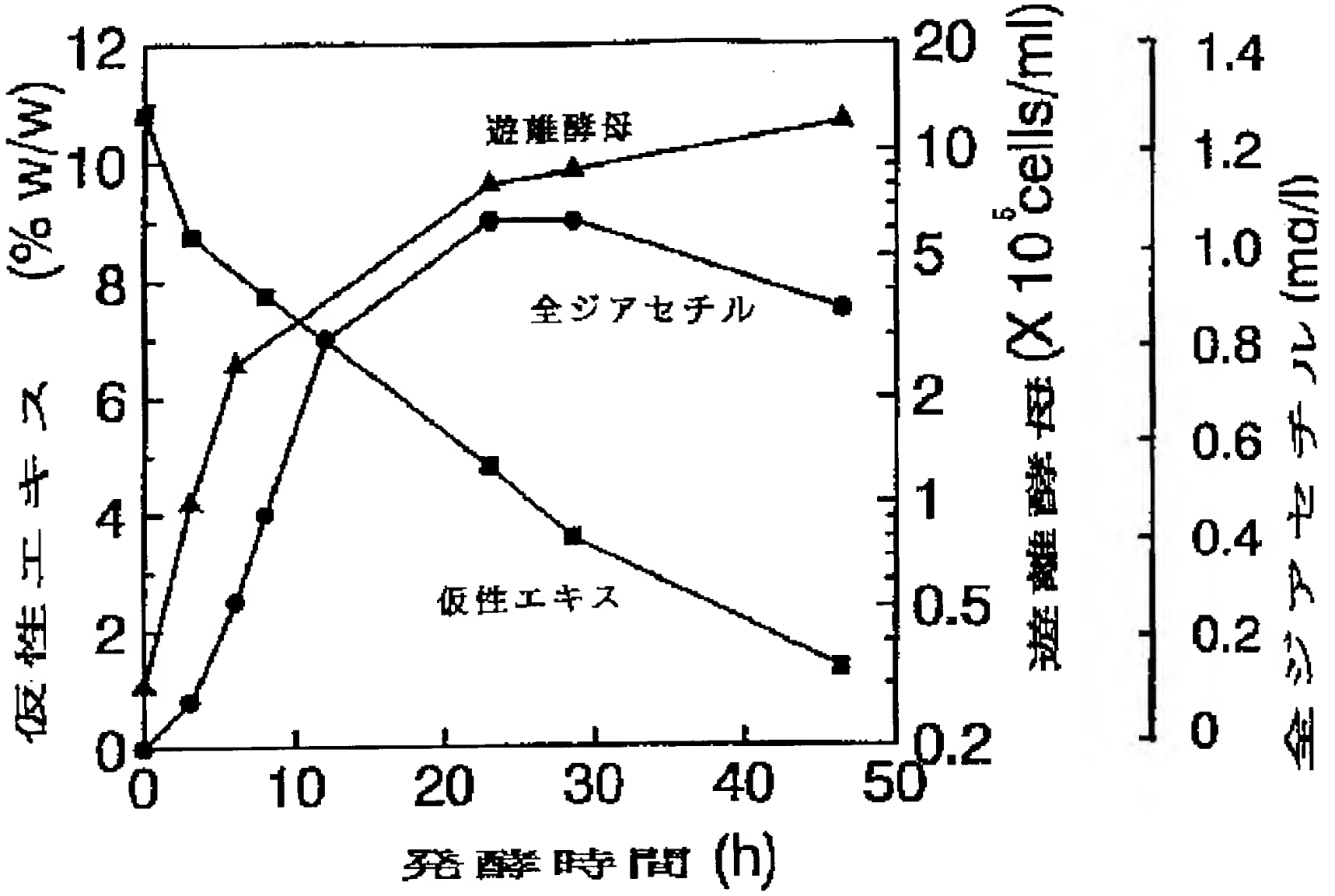
仮性エキス (% W/W)
遊離酵母 (X 10^5 cells/ml)
全ジアセチル (mg/l)
遊離酵母
全ジアセチル
仮性エキス
発酵時間 (h)
0
2
4
6
8
10
12
0.2
0.5
1
2
5
10
20
0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
0
10
20
30
40
50

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